REMARKS

Applicants appreciate the continued thorough examination of the present application that is reflected in the non-final Official Action of February 7, 2008. Applicants also appreciate the courtesies accorded by Examiners Toth and Nasser during the telephone interview with the undersigned on June 13, 2008. Applicants request reconsideration of the rejection of independent Claims 1, 8, 9, 19 and 30 over U.S. Patent Application Publication 2003/0083716 to Nicolelis et al. in view of U.S. Patent 6,366,813 to DiLorenzo, for the reasons that will now be described.

Interview Summary Under MPEP §713.04

Applicants appreciate the courtesies that were extended by the Examiners to the undersigned during the telephone interview on June 13, 2008. During the telephone interview, the arguments made below were discussed with the Examiners. The Examiners concluded that the independent claims are in condition for allowance, subject, of course, to an update search. The above constitutes a complete summary of the telephone interview conducted between the Examiners and the undersigned pursuant to MPEP §713.04.

Independent Claims 1, 19 and 30 Are Patentable Over Nicolelis et al. In View of DiLorenzo

Independent Claims 1, 19 and 30 stand rejected under 35 USC §103(a) over Nicolelis et al. in view of DiLorenzo. These claims are patentable for at least the following reasons.

First, these claims recite extracting single neuron action potentials - i.e., the firing of a single neuron. Nicolelis et al. relates to an *"Intelligent Brain Pacemaker for Real-Time Monitoring and Controlling of Epileptic Seizures"*, as noted in the Nicolelis et al. title, and DiLorenzo relates to *"Apparatus and Method for Closed-Loop Intracranical [sic] Stimulation for Optimal Control of Neurological Disease"*. Neither reference is configured to extract single neuron action potentials, i.e., the firing of a single neuron.

Moreover, these claims recite extracting single neuron action potentials with waveforms that exceed 500 Hz. In monitoring and controlling epileptic seizures, Nicolelis et al. is permeated with examples of extracting waveforms at frequencies well below 500 Hz, in order to monitor brainwave field potential traces, and thereby control epileptic seizures. Rather than being non-limiting examples, these frequencies appear critical to Nicolelis et al.'s ability to provide an intelligent brain pacemaker for real-time monitoring and controlling of epileptic seizures. Per Nicolelis et al., epileptic seizures simply would not be monitored or controlled using frequencies that exceed 500 Hz. DiLorenzo attempts to provide closed-loop intracranial stimulation for optimal control of neurological disease using higher frequency waveforms, but these higher frequency waveforms would not be usable in the devices proposed by Nicolelis et al. Stated differently, Nicolelis et al. would not provide an intelligent brain pacemaker for real-time monitoring and controlling of epileptic seizures if frequencies greater than 500 Hz were used.

In conclusion, independent Claims 1, 19 and 30 extract single neuron action potentials, which are not taught or suggested by either of the cited references, and would not appear to have any place in an epileptic seizure pacemaker. Moreover, if frequencies over 500 Hz were used in the intelligent brain pacemaker, it simply would cease to operate.

Independent Claims 8 and 9 Are Separately Patentable Over Nicolelis et al. In View of DiLorenzo

Independent Claims 8 and 9 also stand rejected under 35 USC §103(a) over Nicolelis et al. in view of DiLorenzo. Claims 8 and 9 recite extracting single neuron action potentials with waveforms that exceed 500 Hz and are, therefore, patentable for at least the same reasons that were described above. Claims 8 and 9 are also separately patentable for at least the following reasons:

Claims 8 and 9 recite that the same electrodes are used to capture the electrical signals that are associated with a neuron and to stimulate the neuron itself, so that the electrodes operate in a bidirectional manner. The combination of Nicolelis et al. and DiLorenzo simply would not suggest this recitation because both Nicolelis et al. and DiLorenzo provide closed-loop systems for detecting and controlling specific diseases. In both, the stimulation site is different from the brain/body areas from which the disease state is detected. Stimulation is going to different places - not to the area recorded.

Specifically, Nicolelis et al. obtains measurements from a mammal's brain, and stimulates a mammal's cranial nerve, to terminate or ameliorate a seizure. DiLorenzo obtains signals from various parts of the brain, and stimulates various parts of the nervous system. Using the same electrodes to capture the electrical signals and to stimulate the neuron itself simply does not apply to the closed loop control systems of Nicolelis et al. and DiLorenzo.

Finally, the passage of DiLorenzo that was cited in the Official Action (DiLorenzo Column 27, lines 8-10), simply states:

> ...Spike detector **89** passes waveforms to spike characterizer **90**, which uses well known techniques to calculate parameters than characterize the behavior of the individual and groups of neurons, the activity of which is sensed by intracranial stimulating electrode array **37**.

This passage simply does not describe or suggest bidirectional operation of a given electrode.

Accordingly, Claims 8 and 9 are separately patentable.

Conclusion

For at least the reasons described above, the independent claims are patentable. The dependent claims are patentable at least per the patentability of the independent claims from which they depend. Accordingly, Applicants respectfully request withdrawal of the outstanding rejections and allowance of the present application.

Respectfully submitted,

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CERTIFICATION OF TRANSMISSION

I hereby certify that this correspondence is being transmitted via the Office electronic filing system in accordance with § 1.6(a)(4) to the U.S. Patent and Trademark Office on June 13, 2008.

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